

What is claimed is:

[Claim 1] 1. An apparatus for discharging dry bulk material by aeration comprising

a substantially annular flexible aeration liner; coaxially disposed upon a substantially frusto-conical perforated hopper, which is affixed to an air disc assembly;

whereby air introduced into the air disc assembly is distributed evenly through the perforated hopper that supports the aeration liner that tends to fluidize dry bulk material, thereby allowing the material to discharge.

[Claim 2] 2. The apparatus of claim 1 further comprising a hopper support ring having a smaller diameter than the hopper disposed between the hopper and the air disc assembly to increase the load bearing capability of the hopper.

[Claim 3] 3. The apparatus of claim 1, wherein the perforated hopper angle is at least 15 degrees from horizontal.

[Claim 4] 4. The apparatus of claim 3, wherein the angle formed by the frusto-conical hopper is about 20 degrees from horizontal.

[Claim 5] 5. The apparatus of claim 1, the hopper having a plurality of holes such that the total area of the holes is between 20% and 50% of the area of the hopper.

[Claim 6] 6. The apparatus of claim 1, the hopper comprising
a center opening;
a plurality of holes equally spaced on a radius close to the center opening;

a plurality of holes equally spaced on an intermediate radius about the center opening; and
a plurality of holes equally spaced on a radius near the outer edge of the hopper.

[Claim 7] 7. The apparatus of claim 1, the aeration liner comprising
a semi-circular top panel;
a semi-circular bottom panel; and
a webbing strip for joining the top panel and bottom panel.

[Claim 8] 8. The apparatus of claim 7, wherein said panels are made of four-ply polyester woven fabric and the webbing strip is made of one selected from the group consisting of polyester and nylon.

[Claim 9] 9. The apparatus of claim 1, the aeration liner comprising a plurality of perimeter holes equally spaced on a radius near the inner opening of the annulus.

[Claim 10] 10. The apparatus of claim 1, the aeration liner comprising roped edge located at a perimeter flange area.

[Claim 11] 11. The apparatus of claim 1, the aeration liner comprising a plurality of equally spaced scallop cut openings along the perimeter flange area for facilitating removal and replacement of the liner.

[Claim 12] 12. The apparatus of claim 1, the air disc assembly comprising
a dished head;
an access port opening formed into the dished head;
an air stub for attaching a source of air attached to the dished head; and
an outlet opening at the center of the dished head.

[Claim 13] 13. The apparatus of claim 12, further comprising an outlet collar attached to the dished head and surrounding the outlet opening; and an outlet flange attached to the outlet collar.

[Claim 14] 14. The apparatus of claim 1, wherein the air disc assembly is welded to the perforated hopper, thereby forming an air compartment between the air disc dished head and the perforated hopper that diffuses air equally.

[Claim 15] 15. The apparatus of claim 1, further comprising an outlet flange ring adapted to secure the aeration liner to the air disc assembly.

[Claim 16] 16. The apparatus of claim 12, further comprising a rotary valve assembly in communication with the outlet opening for controlling the discharge of dry bulk material.

[Claim 17] 17. The apparatus of claim 10, further comprising a silo hopper adapted to be secured to the air disc assembly by bolts on a bolt ring on the perimeter flange such that the aeration liner roped edge is outside the perimeter flange.

[Claim 18] 18. The apparatus of claim 17, the aeration liner comprising a plurality of equally spaced scallop cut openings along a perimeter flange area matching the bolt locations so that the liner can be removed by loosening the bolts and not removing the bolts.

[Claim 19]

19. The apparatus of claim 16, further comprising an entry tube and an exit tube, each tube being in communication with the rotary valve assembly.

[Claim 20] 20. An apparatus for discharging dry bulk material by aeration comprising

a substantially annular flexible aeration liner having a roped edge on a liner perimeter flange and a plurality of scallop cut openings along the perimeter flange; the liner coaxially disposed upon

a substantially frusto-conical perforated hopper, which is welded to an air disc assembly;

whereby air introduced into the air disc assembly is distributed evenly through the perforated hopper that supports the aeration liner that tends to fluidize dry bulk material, thereby allowing the material to discharge.

[Claim 21] 21. The apparatus of claim 1, wherein the hopper has a plurality of discharge outlets, and is made of a plurality of sections.

[Claim 22] 22. The apparatus of claim 1, further comprising multiple liner sections and multiple outlets.